

Molecular Imaging Targeting Strategies

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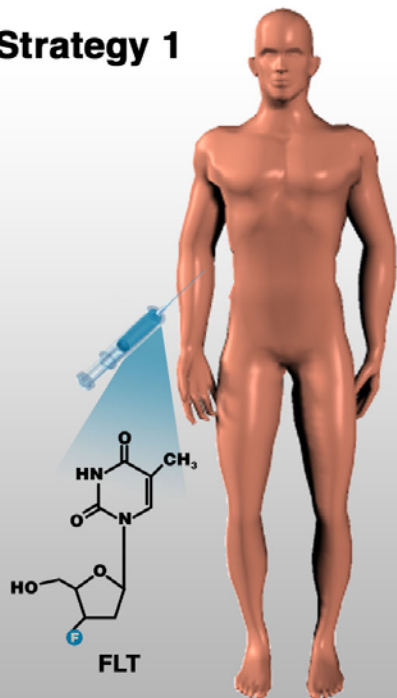
NIBIB

March 2003

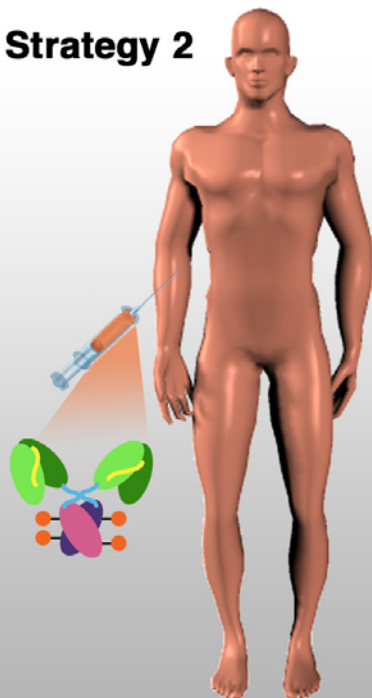


Emerging Strategies for Molecular Imaging

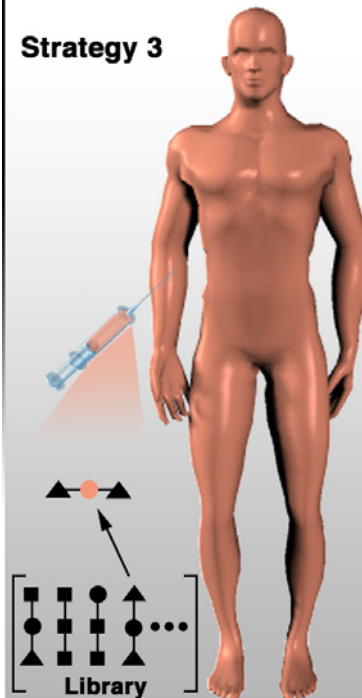
Strategy 1



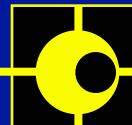
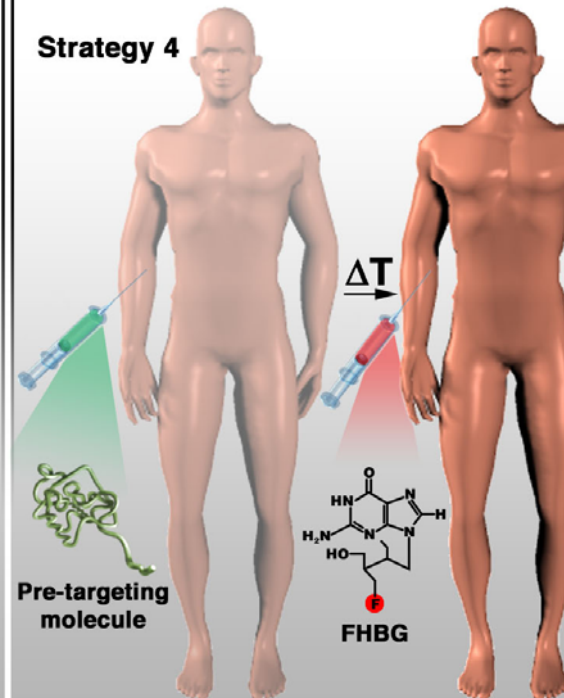
Strategy 2



Strategy 3



Strategy 4



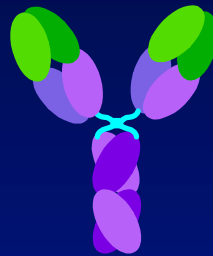
MicroPET Imaging of CEA

thymic mouse with
S174T (CEA+) and C6
(CEA-) xenografts

ected with 70 μCi ^{124}I -
anti-CEA minibody
engineered antibody
fragment, scFv- $\text{C}_{\text{H}3}$)

canned 18 hr post
injection

ayscale image is FDG



Intact chimeric Ab
150 kDa



Minibody
80 kDa

QuickTime™ and a YUV420 codec decompressor are needed to see this picture.

C6



LS174T



ambhir, S.S., Nature Cancer Reviews, 2002

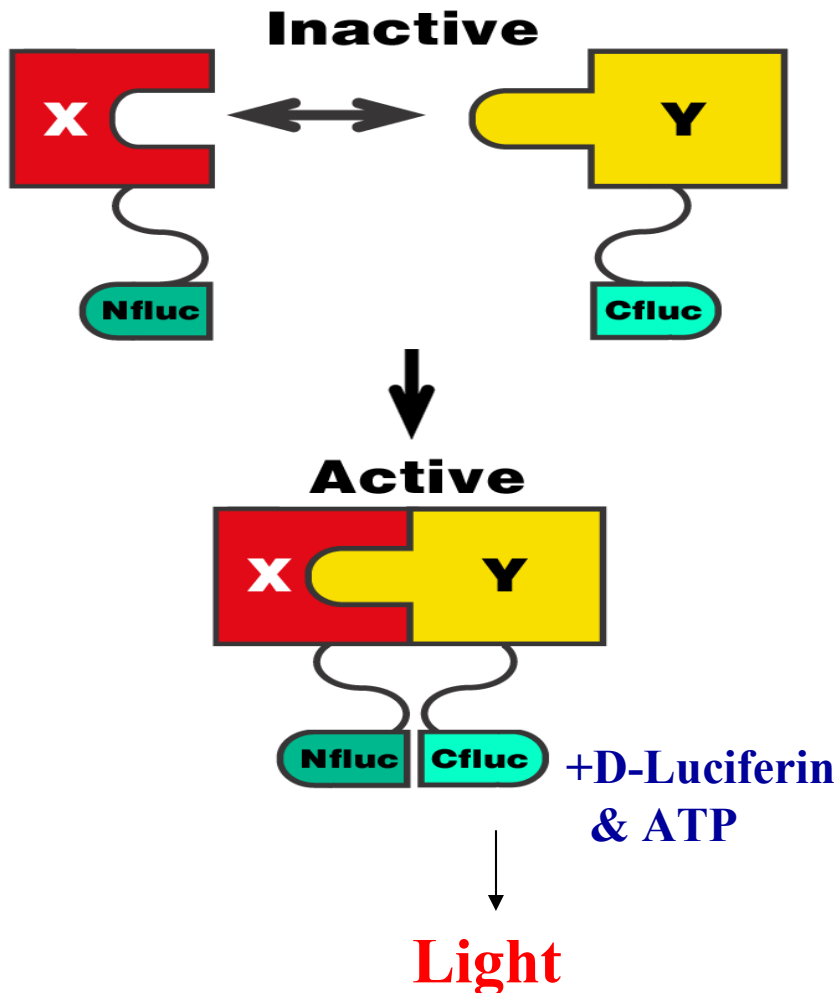
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STRATEGIES USED FOR STUDYING PROTEIN-PROTEIN INTERACTIONS (Pre-Targeting Strategy)

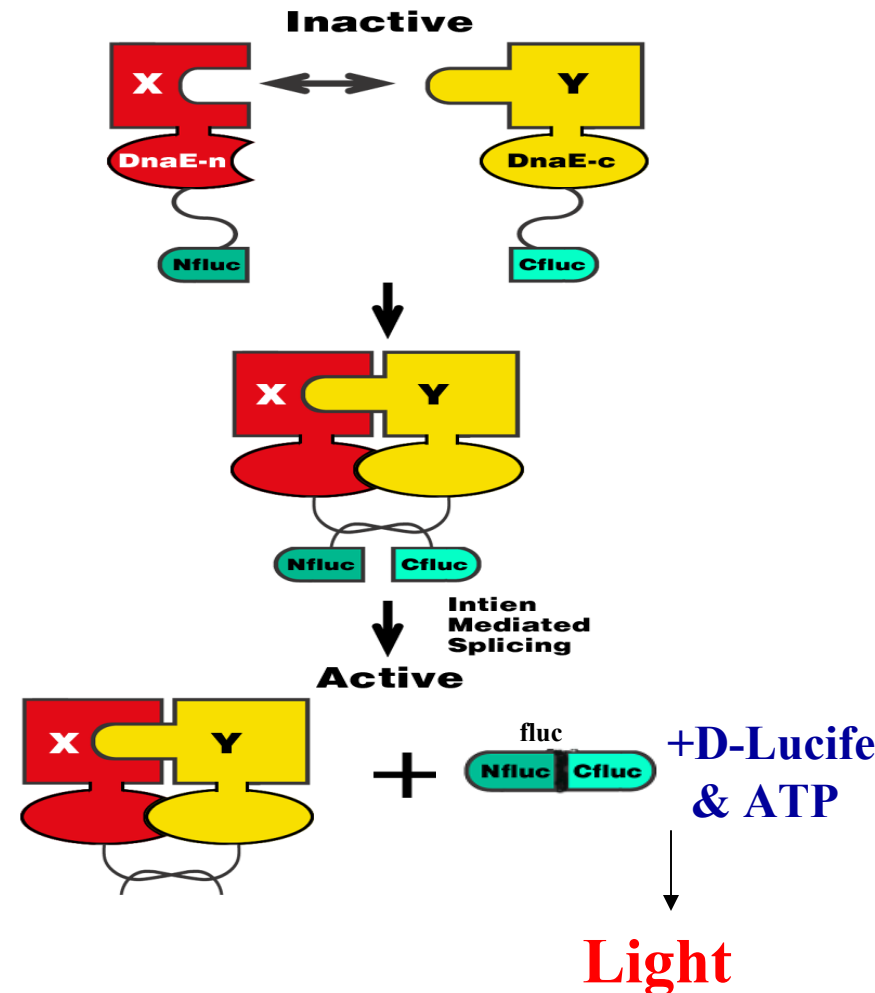
A

COMPLEMENTATION

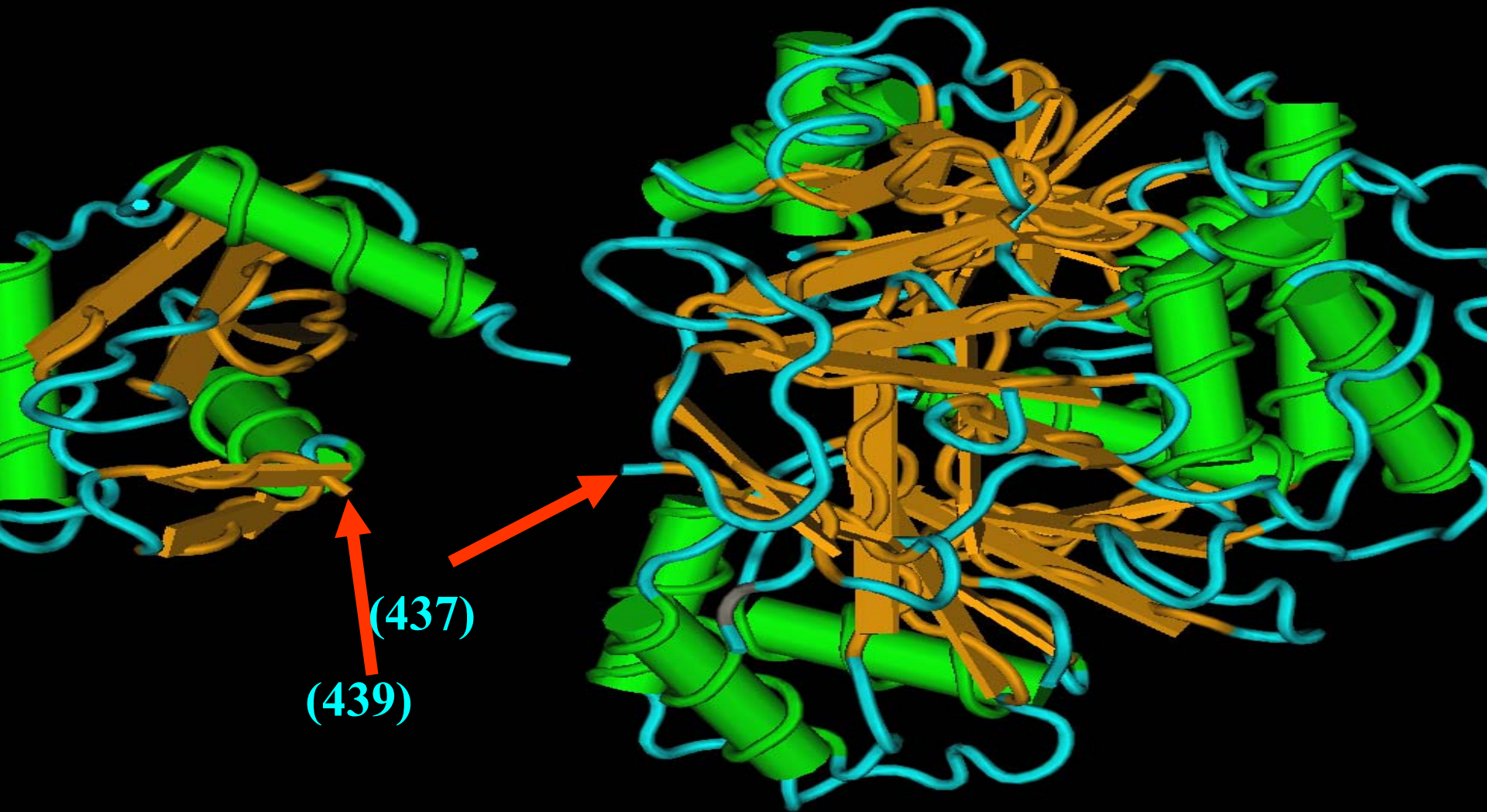


B

RECONSTITUTION

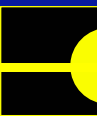


THREE DIMENSIONAL STRUCTURE OF FIREFLY LUCIFERASE PROTEIN SHOWING THE SITE USED FOR SPLITTING THE ENZYME TO DEVELOP PROTEIN COMPLEMENTATION

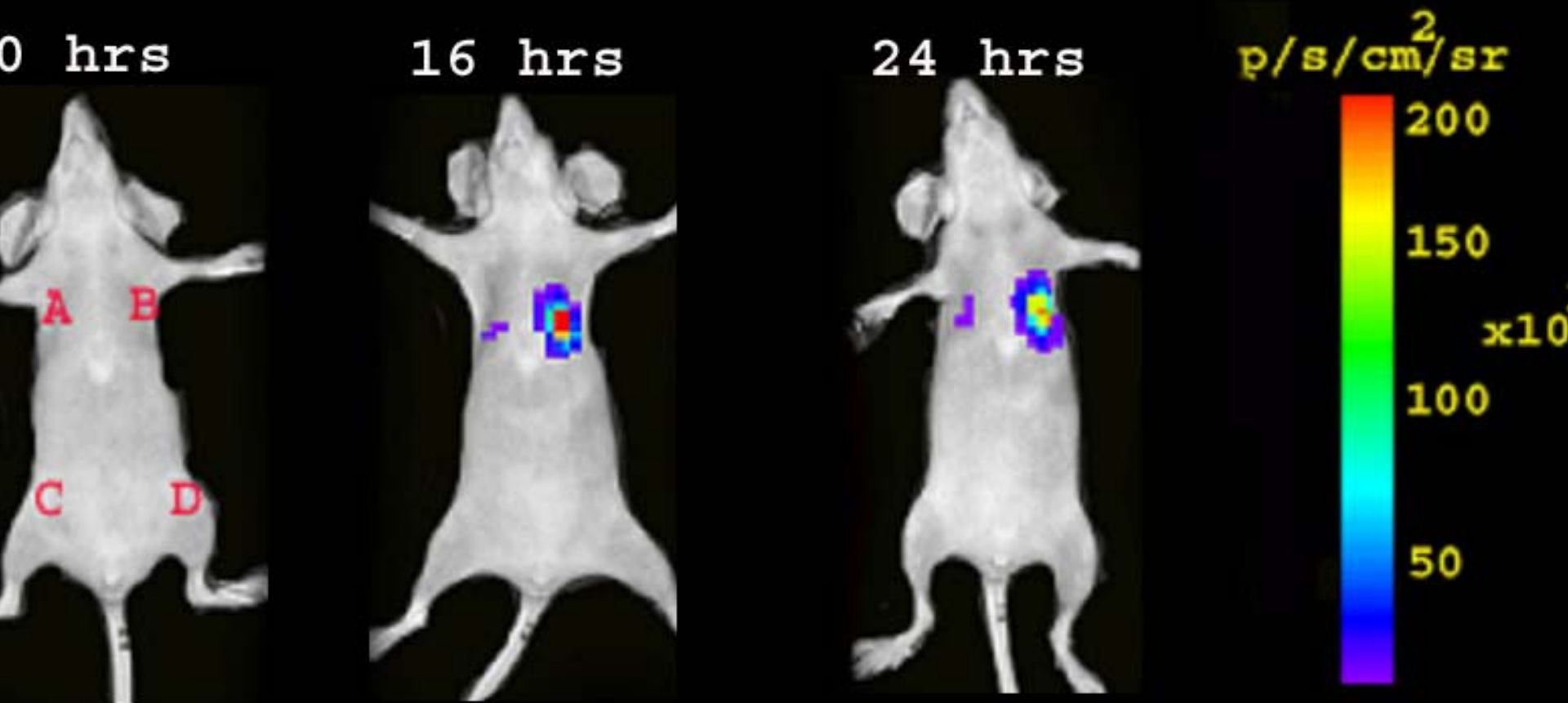


Paulmurugan et. al. PNAS, November 2002

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NONINVASIVE OPTICAL IMAGING OF PROTEIN-PROTEIN INTERACTIONS IN LIVING MICE

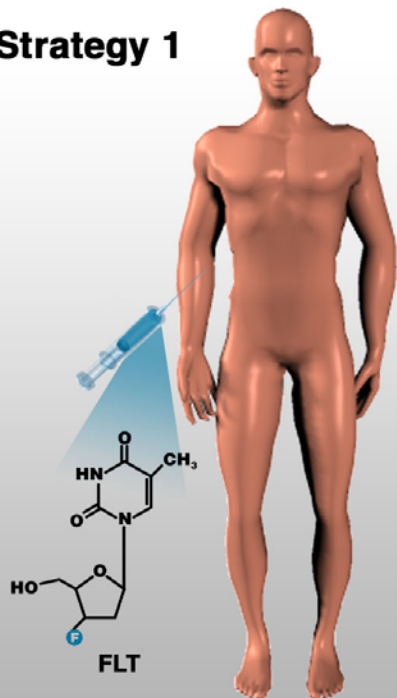


A:NLUC-ID B:NLUC-ID+CLUC-MYOD C:CLUC-MYOD D: MOCK

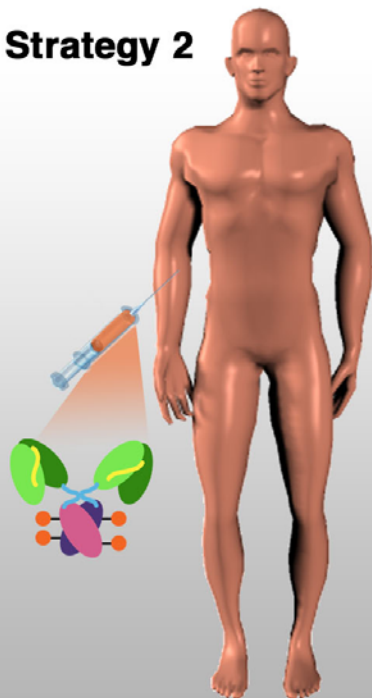
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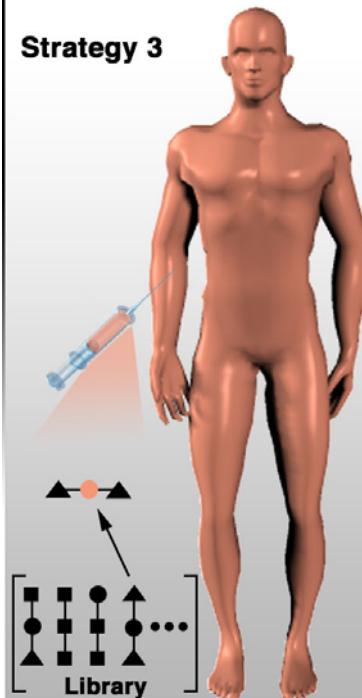
Strategy 1



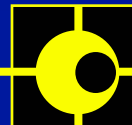
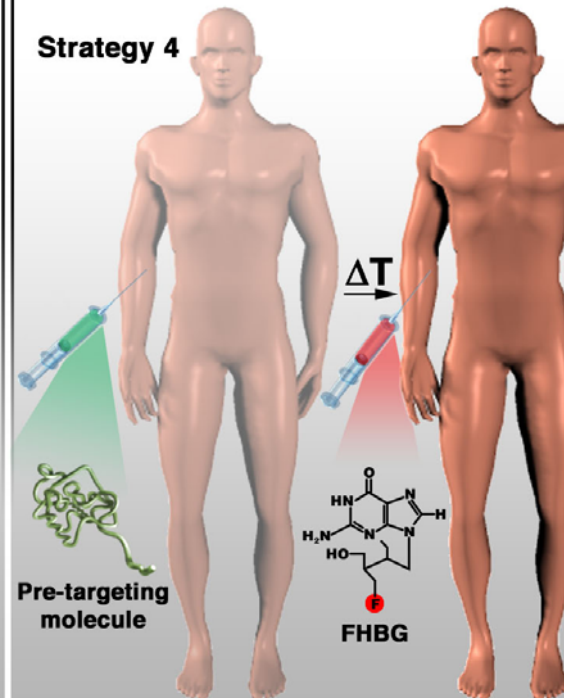
Strategy 2



Strategy 3



Strategy 4



Challenges for the Next Decade

Molecular Imaging using Generalizable Probes/Strategies

Systems Imaging with Multimodality Multiplexing Strategies

Linking of Therapeutic Efficacy with Molecular Imaging

Increased Investments in Chemistry & Cell/Molecular Biology

**Increased Collaborations with Academia and
Biotechnology/Pharmaceutical Companies**

